

WHAT IS CLAIMED IS:

1. A network device configured to control communication of data frames between stations, comprising:
 - a logic device configured to detect a condition associated with a resource on the network device;
 - 5 a frame generating device configured to generate a pause frame requesting suspension of data traffic in response to the detection of the condition, the pause frame including a priority indicator; and
 - a transmit device configured to transmit the pause frame to at least one station.
2. The network device of claim 1, wherein the priority indicator includes information representing one of a plurality of types of data frames.
3. The network device of claim 2, wherein the plurality of types of data frames includes high priority frames and low priority frames.
4. The network device of claim 1, further comprising:
 - a plurality of queues for storing frame forwarding information, the plurality of queues having different levels of priority; and
 - a priority detection device configured to:
 - 5 identify a priority associated with a data frame received by the network device, and
 - store frame forwarding information associated with the data frame in one of a plurality of queues based on the identified priority.

5. The network device of claim 4, the logic device being further configured to detect the condition when frame forwarding information associated with a predetermined number of data frames having a first priority are stored in a first one of the plurality of queues.

6. The network device of claim 1, wherein the condition relates to a congestion condition associated with data frames having a first priority, and
the priority indicator includes information representing the first priority, the at least one station suspending transmission of data frames relating to the first priority for a period of time
5 after receiving the pause frame and continuing transmission of data frames having a priority other than the first priority.

7. The network device of claim 1, wherein the condition relates to a congestion condition, the congestion condition occurring when a predetermined number of data frames having a first priority are stored in at least one of an input queue and an output queue associated with a first port of the network device.

8. The network device of claim 1, wherein the condition comprises a congestion condition, the congestion condition occurring when a portion of a predetermined number of data frames having a first priority are stored in an input queue of a device configured to generate frame forwarding information.

9. The network device of claim 1, wherein the transmit device is further configured to transmit an auto-negotiation message to the at least one station, the auto-negotiation message including information relating to the priority indicator.

10. The network device of claim 1, further comprising:

a receive device configured to receive data frames from the stations, the data frames

having a priority indicator; and

priority mapping logic configured to convert the priority indicator received with the

5 respective data frames to one of a number of priority levels supported by the network device.

11. In a network device that controls communication of data frames between stations, a

method comprising:

detecting a condition on the network device;

generating a pause frame requesting suspension of data traffic in response to detecting

5 the condition, the pause frame including a priority indicator; and

transmitting the pause frame to at least one station.

12. The method of claim 11, wherein the detecting a condition includes detecting a

congestion condition relating to a first one of a plurality of types of data frames.

13. The method of claim 12, wherein the plurality of types of data frames includes high priority frames and low priority frames, the priority indicator in the pause frame corresponding to the first type of data frame.

14. The method of claim 11, wherein the detecting a condition includes detecting when frame forwarding information for a predetermined number of frames are stored in a queue on the network device, the method further comprising:

identifying a priority associated with the queue, the priority corresponding to the priority

5 indicator in the pause frame.

15. The method of claim 11, wherein the detecting a condition includes detecting a congestion condition associated with at least one of an input queue and an output queue on the network device.

16. The method of claim 11, wherein the detecting a condition includes detecting a congestion condition associated with data frames having a first priority.

17. The method of claim 16, further comprising:
identifying the first priority, the priority indicator in the pause frame corresponding to the first priority.

18. The method of claim 17, wherein the at least one station stops transmitting data frames having the first priority for a period of time after receiving the pause frame and continues transmitting data frames having a priority other than the first priority.

19. The method of claim 11, further comprising:
transmitting an auto-negotiation message to the at least one station prior to transmitting the pause frame, the auto-negotiation message including information relating to the priority indicator.

20. The method of claim 11, further comprising:
receiving a data frame including a priority indicator; and
mapping the priority indicator received with the data frame to one of a number of priority levels supported by the network device.

21. A computer-readable medium having a data structure comprising:

- a source address field;
- a destination address field;
- a priority field including information representing a priority level associated with

5 data frames; and

- a pause time field including information representing a length of time for at least one receiving station identified by the destination address field to suspend data transmissions relating to the priority level in the priority field.

10 22. A data communication system, comprising:

a first device configured to:

- receive data frames from at least one station,
- determine a priority associated with the received data frames,
- detect a congestion condition when at least a predetermined number of

data frames of a first priority are being processed by the first device,

15 generate a pause frame requesting suspension of data transmissions in

response to the congestion condition, the pause frame including a priority indicator corresponding to the first priority, and

transmit the pause frame to at least one station; and

20 a second device configured to:

receive the pause frame,

suspend transmission of data frames relating to the first priority, and

continue transmission of data frames relating to a second priority.

23. In a network including a number of network stations and at least one network device configured to control communication of data frames between stations, a first network device, comprising:

a receive device configured to receive data frames from at least one of the network

5 stations and other network devices; and

data frame processing logic configured to:

identify a received data frame as a pause frame, the pause frame including a priority indicator,

map the priority indicator to a first priority,

10 suspend transmission of data frames corresponding to the first priority, and

continue transmission of data frames corresponding to priorities other than the

first priority.